UNIVERSITY OF CAMBRIDGE DEPARTMENT OF PHYSICS
MEDICAL RESEARCH COUNCIL UNIT
CAVENDISH LABORATORY
FREE SCHOOL LANE
CAMBRIDGE

TELEPHONE:
CAMBRIDGE 55478

8th December 1954.

Dr. Rosalind Franklin,
Birkbeck College Crystallography Laboratory,
21 Torrington Square,
London, W.C.1.

Dear Rosalind,

Many thanks for your letter and the draft paper. I had heard that Max had had a copy, but as I expect you know, he is away sick, and so I haven't been able to discuss it with him.

A few comments occur to me. On page 4: the reason for meridional reflection being absent is strictly that the electron density projected onto the axis is smooth. For the case you give, all the 3n + 1 and 3n + 2 layer lines would be weak, which is perhaps true up to a point.

Experience in the past has shown that it is rash to include a drawing with speculation features. It turns up for years and years, and ones reservations get lost in the process. I should be very cautious about your figure 3.

At the bottom of page 5: the real amplitudes of the equatorial reflections comes simply from the screw axis, and not of course, because of any pseudo-symmetry. (This is just a matter of your wording.)

I think you should also be cautious about the X-ray value for the molecular weight of the sub-unit. How possible are values of n other than 12? The chemical values, on the face of them, seem rather good. While we are on this point, I am puzzled about the molecular weight and hydration of TMV. Have you been over all the data carefully? What is wrong, for instance, with Williams' argument in the Cold Spring Harbour Symposium, 1953, page 193?

I don't really like the bit on page 7 about the extra surface. The groove is, after all, not yet firmly established. How much surface, in terms of Å^2, does the chemical work suggest? If you find you can change the salt concentration of the medium you may be able to get much better evidence for the groove.

Finally, have you considered that we have no particular reason that the layer-lines are regular, i.e. why the 3n + 1 and 3n + 2 are not staggered relative to the 3n ones, as they are, for example, in the α-helix. Do your layer-line measurements show any sign of this? If not, how does one explain the fact that the helix repeats exactly after 3 turns?

I hope you won't mind all the criticism. Otherwise the paper is fine, though I was surprised you omitted the method by which you obtained the signs of the equatorials. You don't say where you propose to publish it. I would have thought B. et B. Acta. Practically everybody interested reads it nowadays.

Beatrice is still waiting to hear about her job.

Sydney was here for a few days. A great treat. We managed to cover a lot of ground.

Come and see us sometime.

Yours ever

Francis